



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/590,044	06/08/2000	Joseph M. Jacobson	109026-0068	1282

7590

09/09/2003

TESTA HURWITZ & THIBEAULT  
PATENT ADMINISTRATOR  
HIGH STREET TOWER  
125 HIGH STREET  
BOSTON, MA 02110

EXAMINER

BEREZNY, NEAL

ART UNIT

PAPER NUMBER

2823

DATE MAILED: 09/09/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/590,044

Applicant(s)

JACOBSON ET AL.

Examiner

Neal Berezny

Art Unit

2823

-- The MAILING DATE of this communication appears on the cover sheet with the corresponding address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 29 May 2003.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-31 is/are pending in the application.
- 4a) Of the above claim(s) 14-25, 29 and 30 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-13 is/are allowed.
- 6) ☒ Claim(s) 26-28 and 31 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 June 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Claim Objections*

1. The numbering of claims is not in accordance with 37 CFR 1.126 which requires the original numbering of the claims to be preserved throughout the prosecution. When claims are canceled, the remaining claims must not be renumbered. When new claims are presented, they must be numbered consecutively beginning with the number next following the highest numbered claims previously presented (whether entered or not).

Misnumbered (New) claim 29 has been renumbered to claim 31.

### *Claim Rejections - 35 USC § 103*

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 26-28, 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Connolly (6,399,303) in combination with Heath et al. (American Chemical Society; 1997). Connolly teaches a method of fabricating a bioelectronic component, the method comprising the steps of: positioning a biological material to be in electrical communication with at least one layer of said electrical device to facilitate an electrical measurement thereof, the electrical measurement being affected by the biological material, wherein the biological material is selected from the group consisting of proteins, polypeptides, nucleic acids, polysaccharides, carbohydrates, enzyme substrates, antigens, antibodies, pharmaceuticals, and combinations thereof, see

abstract and col.11, ln.51 to col.12, ln.34. Connolly does not specifically state the step of providing a batch of nanoparticles having submicron sizes and an electrical characteristic; depositing the nanoparticles onto a surface; sintering the batch of nanoparticles to form at least one layer of an electrical device, nor the use of a transistor, nor the formation of an array.

4. Heath teaches providing a batch of nanoparticles having submicron sizes and an electrical characteristic; line 1 of abstract, depositing the nanoparticles onto a surface; p.190, section C; sintering the batch of nanoparticles to form at least one layer of an electrical device; p.191, second par. in Results section, and p.195, col.2, par.1. It would have been obvious to one of ordinary skill in the art at the time of the invention to combine Heath with Connolly to form a thin monolayer of nanoparticles on the substrate in order to empower the artisan to individually manipulate the macroscopic solid with a tailored band structure, which would be useful for increasing the detection sensitivity of the device, see Heath, p.189, col.1, par.1. Similarly, it would have been obvious to one of ordinary skill in the art at the time of the invention to form the well-known array structure of single bio-circuit devices to enable the device to detect more than one biomaterial and to increase the sensitivity of the device. Further, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the well-known practice of using a transistor in the electrical device in order to amplify the signal close to the source of the signal in order to improve the signal-to-noise ratio of the signal, thus improving the sensitivity of the device.

***Response to Arguments***

5. Applicant's arguments filed 5/29/03 have been fully considered but they are not persuasive. Applicant argues that Connolly does not teach the use of nanoparticles, nor does the prior art provide the motivation to combine Heath, and further asserts that Connolly does not teach any of the claimed materials. Applicant's attention is directed to the cited material in the rejection, specifically col.12, ln.21-34, which identifies several of the claimed materials. Further, applicant's attention is directed to Connolly, col.7, ln.1-50, which anticipates the use of several well-known microfabrication methods. It would have been obvious to one of ordinary skill in the art at the time of the invention to seek the application of other well known methods as taught in Heath.

6. Applicant asserts that sintering is not taught in Heath. Applicant's attention is directed to the p.191 citation, which teaches the "annealing of various particle aggregate structures". Further, p.195, col.2, par.1, also teaches a "nanocrystal solution is evaporated onto a TEM grid". Such processes often contain thermal processes, which when interpreted broadly, would constitute sintering.

7. Applicant asserts that the rejection is based on hindsight reasoning. In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long

Art Unit: 2823

as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971). Please see Heath, p.195, col.1, par.1, which also provides a motivation to build troughs as taught in Connolly.

### **Conclusion**

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

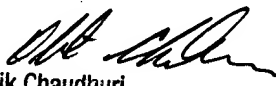
Art Unit: 2823

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Neal Berezny whose telephone number is (703) 305-1481. The examiner can normally be reached on M-F 9:00 - 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri can be reached on (703) 306-2794. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

NB  
September 5, 2003

  
Olik Chaudhuri  
Supervisory Patent Examiner  
Technology Center 2800